REMARKS

Claims 1-12 are rejected. Claims 1-12 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

Rejection Of Claims 1-12 Under 35 U.S.C. §103(a):

The Examiner has rejected Claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over Huang, Xiao-Yang et al. (US 2005/0083284 Al) in view of Lee Sang Kon (US7,164,406 B2).

The Examiner indicates that, regarding Claims 1 and 7, Huang, Xiao-Yang teaches a method of driving an active matrix cholesteric liquid crystal display that includes a matrix of data and select lines and an array of pixels connected to the data and select lines through active switching elements, a pixel being capable of producing two or more gray levels, comprising: a) providing a select voltage and a plurality of data voltages (page 6, paragraph 70, Lines 1-6); and b) during a pixel writing cycle, applying the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +U and -U, having respective duty cycles (please see figure 5a, page 5, paragraph 57, 58, where U is arbitrary) and controlling the duty cycles of the pixel voltage levels to determine the gray levels of the pixels. Although, Huang, Xiao-Yang fails to disclose specifically only three pixel's voltage levels, Lee Sang Kon discloses three only three pixel's voltage levels. (please see figures 3,6A,6B, Vcom is grounded and U+ is Vp+ and U- is Vp-, Col 3, Line 65 to Col. 4, Line 3). The reason to combine is to by changing gate voltages; response speed of active matrix LCD display improves (Col. 1, Lines 9-12). Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Lee Sang Kon in the teaching of. Huang, Xiao-Yang to be able to have the method converges the pixel voltage into the level of common voltage in each vertical period, so as to reduce generation of stepping phenomenon, blurring phenomenon, and afterimages, thereby enabling effective realization of moving pictures in a LCD display.

Huang discloses a graphics controller for a color display system having a bistable liquid crystal display (LCD) for displaying a plurality of pixels arranged in a matrix, which includes a memory device and a generating. In an exemplary case, the bistable LCD is a Cholesteric LCD and, preferably, the

generating device has a first mode of operation in which the data corresponding to the pixels is generated for each corresponding pixel and a second mode of operation in which no data is generated. The generating device switches from the first operating mode to the second operating mode when all of the status bits for all of the pixels are zeros.

Lee discloses a method for driving a liquid crystal display, in which the response speed of a liquid crystal is improved by the change of gate pulse voltage. The method comprises the steps of: sequentially generating a plurality of gate pulse voltages having 1st to 3rd levels while being synchronized with vertical clock signal in said 1 vertical period; in invert driving, dividing the generating period of the plural gate pulse voltages into a charge period, a holding period and a discharge period in respective polar periods corresponding to the 1st to 3rd levels of the plural gate pulse voltage; and converging pixel voltage of the discharge period to a common voltage level, wherein the 3rd level exists in a range between the 1st level and the 2nd level.

The present invention relates to a display and a method of driving an active matrix cholesteric liquid crystal display that includes a matrix of data and select lines and an array of pixels connected to the data and select lines through active switching elements, a pixel being capable of producing two or more gray levels, comprising a) providing a select voltage and a plurality of data voltages; and b) during a pixel writing cycle, applying the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +U and –U, having respective duty cycles and controlling the duty cycles of the pixel voltage levels to determine the gray levels of the pixels, and wherein the average voltage applied to a pixel during the pixel writing cycle is zero.

To establish a prima facia case of obviousness requires, first, there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combines) must teach or suggest all the claim limitations.

As noted by the Examiner, Huang fails to specifically disclose only three pixel's voltage levels. Lee also fails to describe only three pixel's voltage

levels. The Examiner states that U+ is Vp+ and U- is Vp-. This is not the case. According to the present invention, the pixel voltage levels are zero or +/- U. The specification indicates that the variables are simply plus and minus values of a single voltage level, U. (See pg. 5, lines 22- 23 (*"the voltage level to be at ±U"*; pg. 6, line 11 (*"The voltage U used in the experiment was 120 volts"*) and 17-18 (*"Though the voltage level U is high (around 120 volts) in the example shown in Fig. 5"*); see also Figs. 3A, 3B, 4A, 4B, and 5). Review of Lee indicates that Vp(+) is the kickback voltage value in the positive field, not +Vp. See col. 1, lines 50-62. Vp(-) is the kickback voltage value in the positive field, not -Vp. See col. 1, line 63 – col. 2, lines 7. This normal mathematical presentation of a variable used to represent ranges of respective values in the positive and negative field is not the same as a mathematical representation of a +/- for a single value as claimed in the present invention, +U or -U. Neither is there any mention in Lee that the values of Vp(+) and Vp(-) are simply positive and negatives of the same numerical value, and of voltages having the same amplitude. From the review of Fig. 6A and 6B, Vp(+) as compared to Vp(-), it is clear that the values of Vp(+) and Vp(-) are not simply positive and negatives of the same voltage value. The figures show that the amplitude of Vp(-) is larger than Vp(+). According to the present claims, U+ and U- would have the same amplitude since they are merely the positive and negatives of the same absolute voltage value, e.g., +120 and –120 volts. See pg. 5, line 29 (*"By properly choosing voltage level U, .."*). The drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art. In re Aslanian, 590 F.2d 911, 200 USPQ 500 (CCPA 1979). The Figs. of Lee indicate that the amplitude of Vp(+) and Vp(-) are different. Figs. 3A, 3B, 4A, 4B, and 5 of the present invention clearly show the amplitudes of the claimed pixel voltage levels are either zero or plus/minus values of the same amplitude. Further review of Figs. 6A and 6B of Lee also indicates that, in period t2 and the period prior to t1, the voltage is infinitely variable, as indicated by the converging curved lines in Vdata (+). At best, the combination of references would provide a display and a method of driving an active matrix cholesteric liquid crystal display but provides no disclosure directed to applying the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +/- U. In addition, Huang relates to active matrix addressed bistable reflective

cholesteric displays. Lee relates simple to active matrix liquid crystal displays, not bistable cholesteric displays. As indicated throughout Huang, [0006]("*Recent advances in liquid crystal material research have resulted in the discovery of bistable chiral nematic (also called cholesteric) liquid crystal materials. Cholesteric liquid crystal materials are able to maintain a given state (reflective or nonreflective) without the need for the constant application of an electric field.*"), [0011] ("*However, the slow material response time and the unique switching scheme required by the bistable display*"), [0037] ("*Careful design of the drive scheme, implemented via the driver and controller, permits the Cholesteric display to maintain its superior optical performance*") and [0042] ("*In a conventional active matrix display without bistability, a voltage is always applied to maintain the pixels at the selected ON or OFF state.*"). It is not apparent from the references whether or how a drive scheme could be used with an a display and a method of driving an active matrix cholesteric liquid crystal display that applies the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +U and –U. As a result, the references fail to provide some suggestion or motivation, either in the references themselves, to modify the reference or to combine reference teachings.

As discussed above, the references, alone and in combination, fail to provide any likelihood of success in providing an active matrix cholesteric liquid crystal display or method of using such a display which applies the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +U and –U.

Since the references, alone or in combination, fail to disclose or suggest an active matrix cholesteric liquid crystal display or method of using such a display which applies the select voltage and the data voltages to the select and data lines of the display to produce only three pixel voltage levels 0, +U and –U, the references fail to teach or suggest all the claim limitations.

Claims 2-6 benefit from dependence on claim 1, which the Applicants believe is non-obvious in view of Huang and Lee as discussed above.

Claims 8-12 benefit from dependence on claim 7, which the Applicants believe is non-obvious in view of Huang and Lee as discussed above.

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited.

Respectfully submitted,

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